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**ABSTRACT:**

A word processor having an output function for adding margin text, such as a heading or a footing to a main text, includes main text editor, margin text editor, print controller, display device and display device controller. The display controller displays the main text and the margin text simultaneously on the display device in the same form as they are printed out on a paper. Thus, the margin text can be set without printing while an operator confirms its print form.

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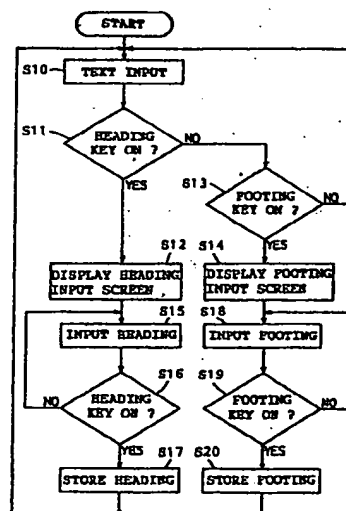
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54 Word processor with a margin text edit function.

57 A word processor having an output function for adding a margin text, such as a heading or a footing to a main text, includes main text edit means, margin text edit means, print means, display means and display control means. The display control means display the main text and the margin text simultaneously on the display means in the same form as they are printed out on a paper. Thus, the margin text can be set without printing while an operator confirms its print form.

FIG. 3



## Description

WORD PROCESSOR WITH A MARGIN TEXT EDIT FUNCTIONTECHNICAL FIELD

This invention relates to a word processor with a function of printing a main text with a margin text, e.g., a heading or a footing.

BACKGROUND ART

A prior art word processor has a function which adds a desired text at a desired position in a margin of a desired page in a document, and outputs the margin text with the main text by a printer. A text output in a top margin of a main text is called a heading, and a text output in a bottom margin of a main text is called a footing.

For editing the margin text, one type of prior art word processor changes the display of the main text to the display of the margin text. In this case, the main text is not displayed on a screen along with the margin text, therefore an operator cannot confirm the positional relationship between the main text and the margin text on the screen. In a second type of prior art word processor, the margin text is displayed with the main text in only a certain page where the margin text is set. Thus, a displayed screen on the other pages is different from the real printing form.

DISCLOSURE OF INVENTION

In order to overcome the abovementioned problems of the prior art, a word processor of the present invention, includes: main text edit means for editing a main text; margin text edit means for editing a margin text which is printed in a margin of the main text on a paper; print means for printing the main text edited by the main text edit means and the margin text edited by the margin text edit means on the paper; display means; and display control means for displaying the main text and the margin text simultaneously on the display means in such a manner as the main text and the margin text are printed on the paper by means of the print means.

Accordingly, this invention provides a word processor in which the operator can confirm the real printing form of the margin text and its neighborhood of the main text on the screen without printing, when the margin text is set.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described with reference to the accompanying drawings wherein:

Fig. 1 is a block diagram illustrating a principle structure of this invention;

Fig. 2 is a block diagram illustrating a schematic structure of a word processor of an embodiment of this invention;

Fig. 3 is a flow chart illustrating the process routine of the embodiment;

Figs. 4A, 4B and 4C are explanatory figures showing screens for inputting a main text, a heading, and a footing respectively; and

Fig. 5 is an explanatory figure showing data

arrangement in a text file stored in an external memory device.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

An embodiment of this invention is set forth in detail according to drawings.

The embodiment explains a word processor in which the top section or the bottom section of a main text in the desired page is displayed with the margin text, i.e., heading or footing, when the margin text is edited. As shown in Fig. 2, the word processor of this invention is provided with a keyboard 1 for inputting characters or edit commands; a display (a CRT display) 3 for displaying characters or figures; a floppy disc drive 5 as an external memory device; a printer 7 for printing characters or figures with type from a daisy wheel; and an electronic control unit (ECU) 10, connected to the devices 1, 3, 5 and 7, for controlling inputting, editing, storing and printing of a text. The ECU 10 is a microcomputer, including CPU 11, ROM 12 and RAM 14. The ECU 10 is further provided with a video RAM 15 for storing picture data of characters or figures which are displayed on the CRT display 3, a keyboard input port 16 for inputting data from the keyboard 1, a floppy disc drive controller 18 for controlling the floppy disc drive 5 so as to read or write the data, a printer output port 20 for outputting the printing data to the printer 7. The video RAM 15 has a structure of a so-called dual port RAM and can be accessed, besides by the CPU 11, by a CRT controller 22 provided independently of the CPU 11. The CRT controller 22 repeatedly reads out data from the video RAM 15 in a cycle determined by a scanning frequency of the CRT display 3, and displays it on the CRT display 3. Accordingly, the data written in a predetermined area of the video RAM 15 by the CPU 11 is immediately displayed on the CRT display 3.

The keyboard 1 is provided with character keys 31 for inputting characters, ten edit keys 33 for editing the text, four cursor keys 35 for moving a cursor, and a keyboard switch 37 for altering assignment of characters to the keys on the keyboard 1 by selecting the type of desired daisy wheels.

An operator can input the text by operating the character keys 31. Moreover, by operating the edit keys 33 such as a heading key 33a or a footing key 33b, the operator can edit another text so as to add the heading or the footing to the text. The edited text can be stored into a floppy disc set in the floppy disc drive 5 controlled by the floppy disc drive controller 18. Also, the text can be output to the printer 7 to be printed on a paper.

With reference to Figs. 3, 4A, 4B and 4C, the procedure for setting the margin text is explained.

Fig. 3 is a flow chart of a process routine for editing the text with a heading and a footing. The process routine for setting the margin text starts in the flow chart of Fig. 3. The main text is being input at S10 as shown in Fig. 4A which is an explanatory

figures showing screens for inputting a main text. It is determined at S11 whether the heading key 33a is operated. If the determination is YES, the picture as shown in Fig. 4B is input into the video RAM 15 by the CPU 11, according to the program stored in the ROM 12, and the input picture is displayed on the CRT display 3 at S12. Then the heading text edit mode begins instead of the main text edit mode. As shown in Fig. 4B, the screen for inputting the heading is divided into two areas. One is an area A for inputting the heading having a predetermined line number (three lines in the drawing) at the upper part of the screen. The other is an area B for displaying the top section of the main text at the page where the heading key 33a is occasionally operated at the lower part of the area A. On the contrary, if the determination is NO at S11, the program proceeds to S13 at which it is determined whether the footing key 33b is operated. If the determination is YES, the picture as shown in Fig. 4C is input into the video RAM 15 by the CPU 11, according to the program stored in the ROM 12, and the input picture is displayed on the CRT display 3 at S14. Then the footing text edit mode begins instead of the main text edit mode. As shown in Fig. 4C, the screen for inputting the footing is also divided into two areas. One is an area D for inputting the footing having a predetermined line number (three lines in the drawing) at the lower part of the screen. The other is an area C for displaying the bottom section of the main text at the page where the footing key 33b is occasionally operated at the upper part of the area D. If the determination is NO at S13, the process step returns to S10.

In case the process step proceeds through S10, S11 and S12, i.e., in the heading text edit mode, the heading text is input at S15. The heading can be edited by freely moving the cursor key 35 within the area A in the same manner as in the main text edit mode. That is, character data or control code data input by the keyboard 1 are written at an address of the RAM 14 corresponding to the position of the cursor displayed on the CRT display 3. Within the area A, various editing functions or printing effects on the heading text, such as centering, right adjust, pitch alteration, boldfacing and so on, can be freely employed. In this case, these editing functions or printing effects do not affect the printing form of the main text.

When the heading is input, it is again determined at S16 whether the heading key 33a is operated. If the determination is YES, it is assumed that the input of the heading ends, and the heading set as above is stored in the RAM 14 or on a floppy disc in the floppy disc drive 5 (described later) at S17. Then the process steps return to S10. Then the input of the main text resumes from the position where the cursor was located when the heading key 33a is operated at S11. On the contrary, if the determination is NO, the input of the heading continues at S15.

If it is determined the footing key 33b is operated at S13, the process steps for editing the footing is executed in the same manner as for the heading. That is, the picture as shown in Fig. 4C is displayed at S14, and the footing text is input at S18. During

inputting, it is determined at S19 whether the footing key 33b is operated. If the determination is YES, it is assumed that the input of the footing ends, and the footing set as above is stored into the RAM 14 or on a floppy disc in the floppy disc drive 5 at S20. Then the process step returns to S10. On the other hand, if the determination is NO at S19, the input of the footing continues at S18. Upon inputting the footing, the printing form of the footing can be freely set so far as within the area D in the same manner as for inputting the heading.

When the heading or the footing is already set, the set heading or footing can be displayed in the area A or D and then can be modified.

In this embodiment having the above-mentioned structure, when the margin text is being edited, the top or the bottom of the main text at the page where the heading key 33a or the footing key 33b is operated, is displayed with the margin text on the CRT display 3 in the same form as printed on a paper. Thus, the operator can confirm the positional relationship between the main text and the margin text when the margin text is set. In this case, the word processor is operable by the operator's choice in two modes: either only the main text is printed out (normal print mode) or the main text and the margin text are printed out together (margin text print mode).

The heading or the footing set as above is stored in the RAM 14 or on a floppy disc in the floppy disc drive 5, with the data arranged in a text file shown in Fig. 5.

The data of a text is orderly aligned in sequence of a STX code (a code for showing start of the text), format of the text, the text, and an ETX code (a code for showing end of the text). Here, the format of the text can be set at optional positions and different formats are set in a text. They are set, for example in Fig. 5, at A1 and B1. The margin text, i.e., heading or footing, is recorded at an appropriate position in the main text file. A margin text record section orderly stores a margin record start code (heading code, footing code), a line number of the margin text, the STX code, format of the margin text, the margin text (heading, footing), the ETX code, and the margin record end code (heading code, footing code).

The edited text is output from the printer output port 20 and is printed by the printer 7 according to the above text file of the RAM 14. When the margin text is set in a certain position of the file, the margin text is printed in every subsequent page according to the printing format. Various different margin texts can be set in a main text, and are stored in the main text file as shown in Fig. 5. The format of the margin text can be changed as occasion demands. The margin text may be recorded in a file independent of the main text file.

While the invention has been particularly shown and described with reference to a preferred embodiment, it will be understood by those skilled in the art that various other changes in form and detail may be made without departing from the spirit and scope of the invention.

margin text data, an exit code and an end field separator, the format data representing exclusively a format of the margin text independent of a format of the main text.

## Claims

1. A word processor comprising:
  - main text edit means for editing a main text;
  - margin text edit means for editing a margin text to be printed in a margin of the main text on a paper;
  - print means for printing the main text edited by the main text edit means and the margin text edited by the margin text edit means on the paper;
  - display means; and
  - display control means for displaying the main text and the margin text simultaneously on the display means in the same manner as the main text and the margin text are printed on the paper by means of the print means.
2. The word processor according to claim 1, wherein:
  - the word processor is operable either in a main text edit mode or in a margin text edit mode;
  - the margin text edit means function only in the margin text edit mode; and
  - the display control means display only the main text on the display means in the main text edit mode and display the main text and the margin text simultaneously on the display means in the margin text edit mode.
3. The word processor according to claim 2, wherein:
  - the word processor is operable either in a normal print mode or in a margin text print mode; and
  - the print means print only the main text in the normal print mode and print the main text and the margin text in the margin text print mode.
4. The word processor according to claim 1, 2 or 3, wherein the margin text is a heading which is printed in a top margin of the main text printed on the paper.
5. The word processor according to claim 1, 2 or 3, wherein the margin text is a footing which is printed in a bottom margin of the main text printed on the paper.
6. The word processor according to claim 1, 2 or 3, wherein the margin text comprises a heading which is printed in a top margin of the main text printed on the paper and a footing which is printed in a bottom margin of the main text printed on the paper.
7. The word processor according to any preceding claim wherein the word processor comprises an external memory device in which the main text and the margin text are stored making a text file.
8. The word processor according to claim 7, wherein the text file in the external memory device comprises one or more of margin text record section and the margin text record section includes a top field separator, a line number data, a start code, a format data, a

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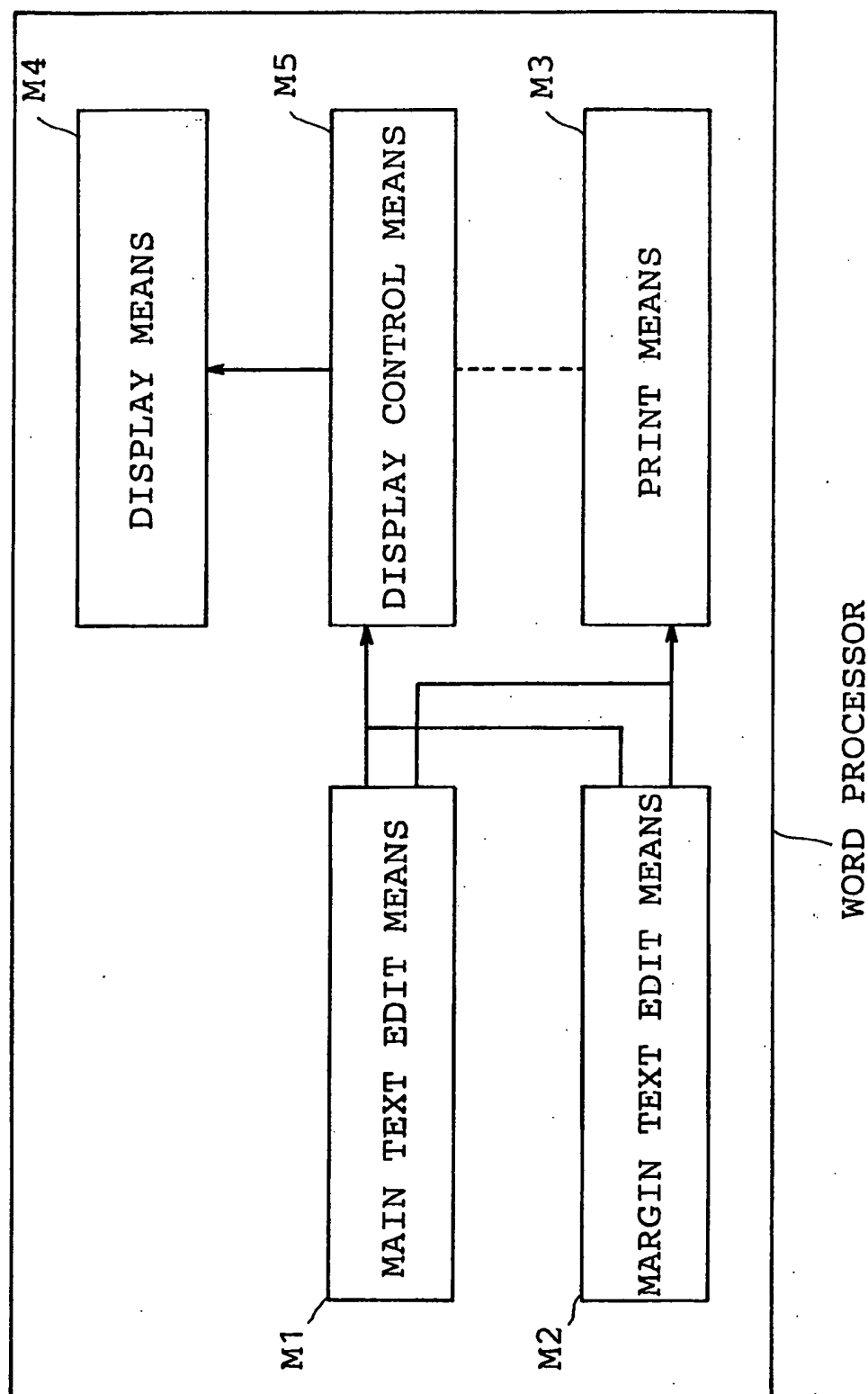
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FIG. 1



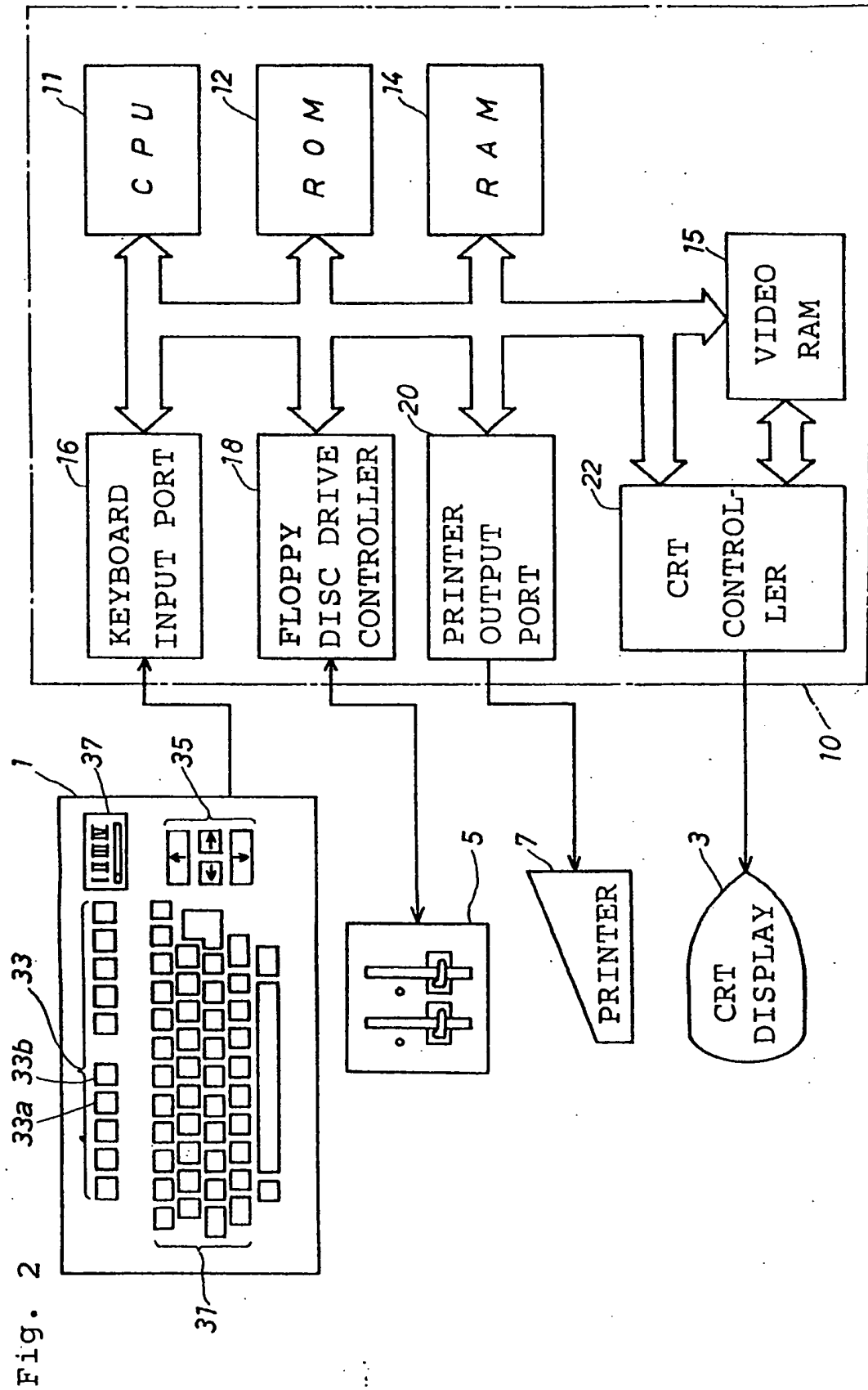


FIG. 3

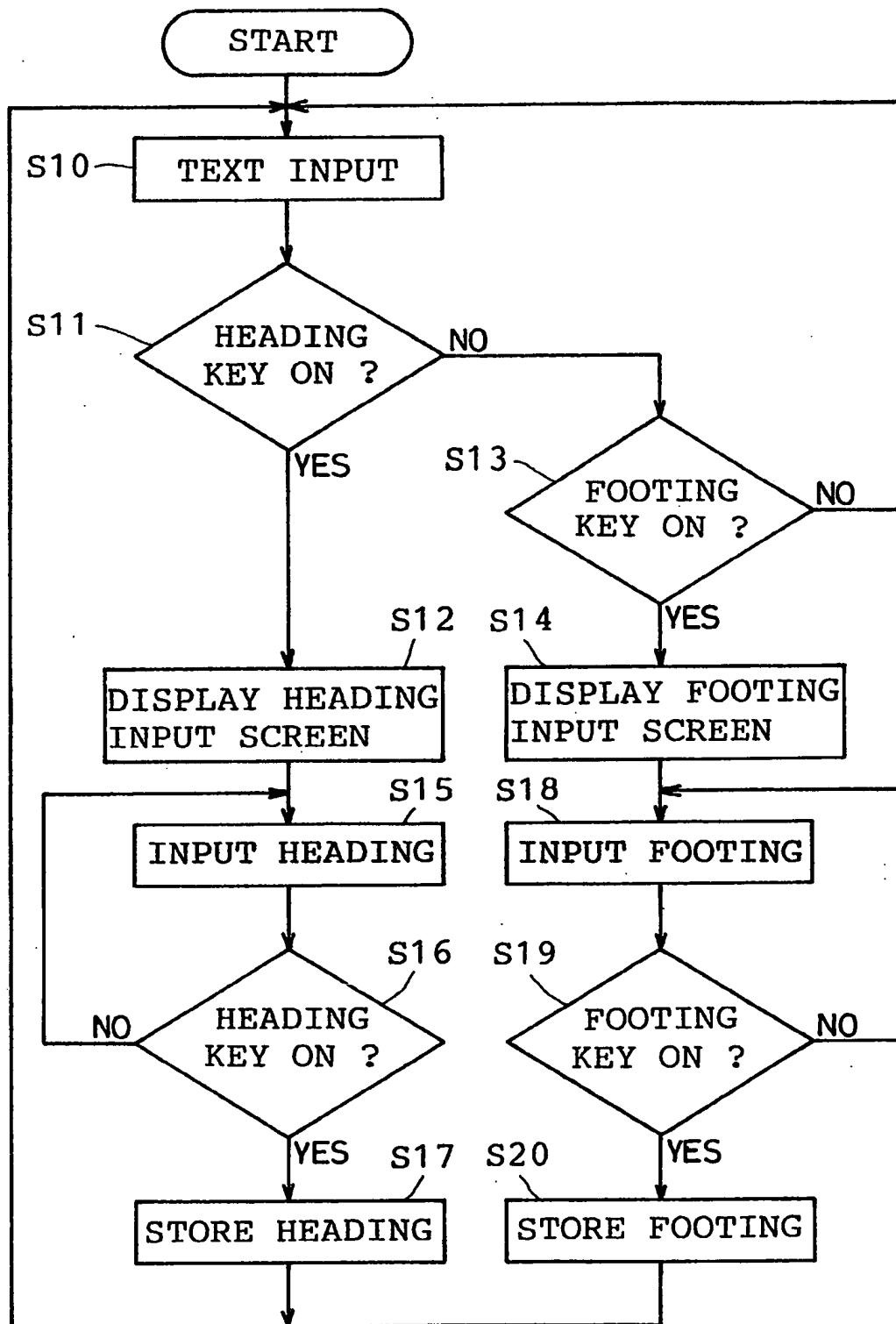




FIG. 4A

```

.....1.....2.....3.....4.....
      A bcd efghijk lmnop qrstuv wxyz.
aaaaa  bbbbbbbbbbbbbbbbbbb cccccccccccc ddd
eeeeee fff gggggg hh iiiii jjjjjjj kkkkkk lllll
mmmmmm nnnnn.
      Qwerty uiop a sdfg hjkl zxcvbnm. ■

```

AREA A

FIG. 4B

## HEADING

```

.....1.....2.....3.....4.....
      QWERTYUI
                                OPASDFGHJKLZ
                                XCVBNM ■
      Poiuytrewq lkj jh gfdsa mn bvcxz.
      A bcd efghijk lmnop qrstuv wxyz.
aaaaa  bbbbbbbbbbbbbbbbbbb cccccccccccc ddd
eeeeee fff gggggg hh iiiii jjjjjjj kkkkkk lllll
mmmmmm nnnnn.
      Qwerty uiop a sdfg hjkl zxcvbnm.

```

AREA B

AREA C

FIG. 4C

## FOOTING

```

.....1.....2.....3.....4.....
aaaaa  bbbbbbbbbbbbbbbbbbb cccccccccccc ddd
eeeeee fff gggggg hh iiiii jjjjjjj kkkkkk lllll
mmmmmm nnnnn.
      Qwerty uiop a sdfg hjkl zxcvbnm.

```

```

      poiuytrewq mnbvcxzz.
      - (1) -      mnbv ■

```

AREA D

FIG. 5

